

WHAT IS CLAIMED IS:

- 1                   1.       A method for detecting a position of an impulse response in a  
2   multipath channel comprising:  
3                   (a) receiving a transmitted signal as a received signal;  
4                   (b) correlating a representation of the received signal with a pseudo-random  
5   number (PN) sequence to produce an evaluation signal, the PN sequence being used to  
6   produce the transmitted signal, the evaluation signal comprising a plurality of peak values;  
7                   (c) identifying a first peak value from among the plurality of peak values;  
8                   (d) determining a position in the evaluation signal of the first peak value,  
9   wherein the position is representative of time;  
10                  (e) determining a threshold value based on the evaluation signal;  
11                  (f) comparing the threshold value with one of the peak values to produce a  
12   comparison result; and  
13                  (g) based on the comparison result, determining whether to:  
14                      produce a new evaluation signal based on the evaluation signal; and  
15                      repeat the steps (c) - (g) using the new evaluation signal,  
16                  wherein a plurality of first peak values are accumulated,  
17                  wherein a position of an impulse response corresponds to the first peak value  
18   in the plurality of first peak values whose associated time is the earliest.
- 1                   2.       The method of claim 1 wherein the new evaluation signal is produced  
2   by subtracting a template signal from the evaluation signal.
- 1                   3.       The method of claim 1 wherein the threshold value is based on the  
2   peak values comprising the evaluation signal, exclusive of the first peak value.
- 1                   4.       The method of claim 1 wherein the threshold value is based on a ratio  
2   between the first peak value and the other peak values comprising the evaluation signal.

1                    5.        Apparatus for identifying a position of an impulse response in a  
2        multipath channel comprising:  
3                    a data processing unit; and  
4                    a memory component in data communication with the data processing unit, the  
5        memory component containing a first memory configured with computer program code,  
6                    the computer program code configured to operate the data processing unit to  
7        perform the method steps as recited in claim 1.

1                    6.        A signal detection method comprising:  
2                    (a) receiving a transmitted signal as a received signal, the transmitted signal  
3        comprising a first signal correlated with a pseudo-random number sequence, the first signal  
4        representative of an information signal, the received signal comprising one or more reflected  
5        signals and a line-of-sight signal;  
6                    (b) producing a matched signal from the received signal;  
7                    (c) correlating the matched signal with the pseudo-random number sequence  
8        to produce a correlated signal, the correlated signal comprising a main lobe and a plurality of  
9        side lobes;  
10                    (d) determining a peak value of the main lobe;  
11                    (e) determining a time value associated with the peak value of the main lobe;  
12                    (f) determining a threshold value based on the correlated signal; and  
13                    (g) if the threshold value exceeds a value based on the side lobes, then  
14        subtracting a template signal from the correlated signal to produce a new signal and repeating  
15        the steps (c) - (g) with the new signal, wherein the threshold value is recomputed with each  
16        iteration of the steps (c) - (g),  
17                    wherein a plurality of time values are produced,  
18                    wherein the smallest of the time values represents the arrival time of the line-  
19        of-sight signal.

1                    7.        The method of claim 6 wherein the first signal is the information  
2        signal.

1                    8.        The method of claim 6 wherein the threshold value is based on peak  
2        values of the side lobes.

1                   9.       The method of claim 6 wherein the threshold value is based on a ratio  
2 between the peak value of the main lobe and a peak value of each side lobe.

1                   10.     A signal detection processor comprising:  
2                   means for receiving a digital signal, the digital signal representative of a  
3 transmitted signal, the transmitted signal formed by correlating an information signal with a  
4 PN sequence;  
5                   means for correlating the digital signal with the PN sequence to produce a  
6 correlated signal;  
7                   means for detecting a peak value in the correlated signal including associating  
8 a time value representative of the position of the peak value in the correlated signal;  
9                   means for determining a threshold value based on the correlated signal;  
10                  means for producing a new correlated signal from the correlated signal; and  
11                  means for repeating the process using the new correlated signal, if a  
12 comparison of the threshold value with the correlated signal produces a first comparison  
13 result,  
14                  thereby accumulating a plurality of peak values.

1                   11.     The processor of claim 10 wherein the means are provided as computer  
2 program code.

1                   12.     The processor of claim 10 wherein the recited means are performed on  
2 a data processing unit.

1                   13.     The processor of claim 10 wherein the means for determining a  
2 threshold is based on peaks in the correlated signal exclusive of the detected peak value.

1                   14.     The processor of claim 10 wherein the means for producing a new  
2 correlated signal includes subtracting a template signal from the correlated signal.